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THE
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☞See advertisement on last page.

Poetry.

THE SONS OF TOIL.

You cannot pay with money
The million sons of toil—
The sailor on the ocean,
The peasant on the soil,
The labourer in the quarry,
The hewer of the coal;
Your money pays the hand,
But it cannot pay the soul.

You gaze on the cathedral,
Whose turrets meet the sky;
Remember the foundations
That in earth and darkness lie,
Nor, were not those foundations
So darkly resting there,
Yon towers could not soar up
So proudly in the air.

The workshop must be crowded
That the palace may be bright:
If the ploughman did not plough
Then the poet could not write.
Then let every toil be hollowed
That man performs for man,
And have its share of honor
As part of one great plan.

See, light darts from heaven,
And enters where it may;
The eyes of all earth's people
Are cheered with one bright day.
And let the mind's true sunshine
Be spread over earth as free,
And fill the souls of men
As the waters fill the sea.

The man who turns the soil
Need not have an earthly mind;
The digger 'mid the coal
Need not be in spirit blind,
The mind can shed a light
On each worthy labor done,
As lowest things are bright
In the radiance of the sun.

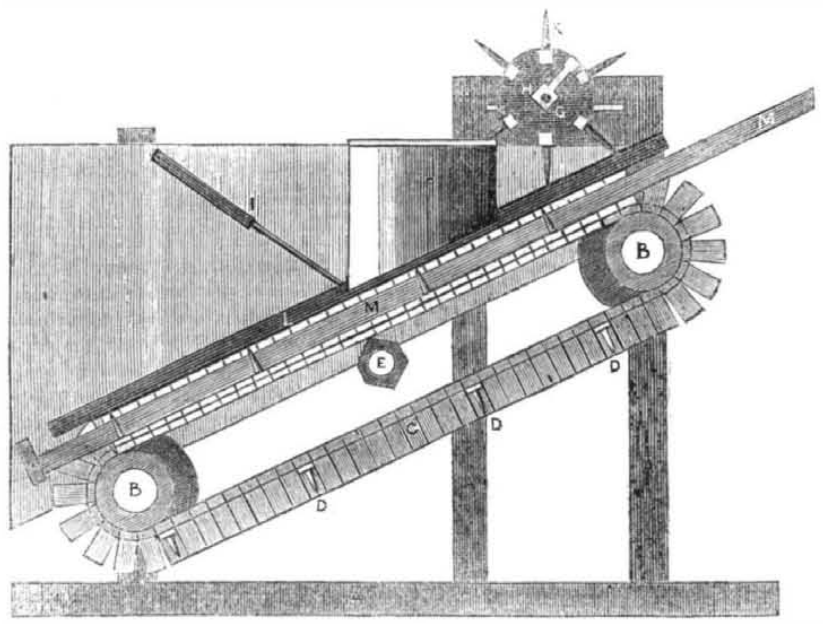
The tailor, ay, the cobbler,
May lift their heads as men,—
Better far than Alexander,
Could he wake to life again,
And think of all his bloodshed,
(And all for nothing too!)
And ask himself—What made I,
As useful as a shoe?

What cheers the musing student,
The poet, the divine?
The thought that for his followers
A brighter day will shine.
Let every human laborer
Enjoy the vision bright—
Let the thought that comes from heaven
Be spread like heaven's own light?

Ye men who hold the pen,
Rise like a band inspired,
And poets let your lyrics
With hope for man be fired?
Till the earth becomes a temple,
And every human heart
Shall join in one great service,
Each happy in his part.

WOODBURY'S IMPROVED GRAIN SEPARATOR.

Figure 1.



This apparatus is the invention of Mr. Daniel Woodbury, of Perkinsville, Vermont, the patentee of a most excellent *horse power* — The nature of this invention is to prevent entirely the escape of any grain along with the straw that is driven out of the Separator. It is well known that when our present *Threshers* and Separators are driven rapidly, (especially large machines,) much annoyance is experienced by the farmer in having to return a large quantity of stuff for re-separation, because much grain, especially that which is light, has escaped with the straw. The invention of Mr. Woodbury completely remedies this evil.

DESCRIPTION.—Figure 1, is a side, or longitudinal section view, and shews the interior arrangements. A, represents the frame. B B, are two drums or rollers which move by a belt a curiously constructed endless web C, for carrying up the grain from the thresher, separating the grain and straw most beautifully before the grain comes to the fanning mill.—This endless band is made of canvass and has a rim composed of a great number of distinct pieces of wood which, when they are moving on a plane are close together but accommodate themselves to the turning of the rollers. They are for keeping the grain, &c. from escaping at the sides. At regular distances of this web are fixed slats crosswise and having teeth or projections of wood or stout wire D, extending across the web at regular distances. M, are a number of slats fixed to the frame and extending a little more than the whole length of the web. These slats may be made of wood of about half an inch square or of wire.—There is one slat for every tooth or D, on the web, and the teeth as they move on the web, work as it were between two slats like a channel. These slats are placed so as to let the teeth D, be a little above them as they revolve. L, is a bevelled side piece nailed snugly to the inside of the elevator P, so as to just let the rim of the web move under it and thereby completely prevent the side escape of the straw. G, is a revolving roller extending across the Separator. it has teeth or projections placed at certain distances across and around it—these revolve in the channels of the slats before spoken of. This roller has two motions, one from side to side, the roller sliding in eyes on a shaft, and it also revolves. As G would not revolve by any motion given to the shaft—H, is an arm on the shaft extending between the frame or two of the cross pieces on which the teeth are fixed, so that when the shaft is driven by a belt and pulley, the arm H will carry round the roller and by the shaking of the roller from side to side by a crank, whatever straw may be carried up the web with grain among it, is shook entirely free from the grain and chaff. I, represents a wire toothed board, below which the straw and grain is discharged from the *thresher*, and as these are discharged to crowd somewhat into the centre, its importance and the double motion of the tooth roller will at once be perceived. The *thresher* therefore discharges below the board, and as the endless web by the cross tooth pieces is divided into a number of shallow chambers, the grain is carried up the incline and guided by a side board extending down on an angle with M, and the grain and chaff is there received in a shoe perfectly free of straw, and then it is separated by the fanner which is driven by a belt from a pulley on E. As this view represents the principle, the pulley is not shewn.

☞*For engraving of Fig.* 2, *see page* 212.

Strange Customs.

The Egyptians had a funeral tribunal, by which the dead were tried before they could be buried. After death, every Egyptian was brought before this tribunal, and, if convicted of having in his life, acted unworthily, he was denied a place in the burial place of his ancestors. This was a great disgrace to his family; and, according to the Egyptian theology, it deprived the spirit of the deceased of an entrance into heaven. One of the things which caused the infliction of this mark of disgrace was that of dying in debt. It, however, the children or friends of the deceased should pay his debts, as they sometimes did, he was allowed to be buried.

Napoleon's Cenotaph.

The Emperor of Russia has presented several enormous and magnificent blocks of black and veined marble, for the completion of Napoleon's cenotaph, which is advancing but slowly, though fourteen or fifteen artists are always at work in sculpturing the statues, medallions, and basso-relievos which are to ornament it.

Fat Land.

An exchange paper says that a Hoosier astonished a Yankee in describtng the richness tho richness of the soil of Indiana. He said it was so fat that they made their candles by dipping them in a mud puddle.

RAIL ROAD NEWS.

Names of Railroads.

It is time that a grand Convention of the Railroad Corporations of the United States and Canada was held, if it were for nothing more than to give appropriate names to the respective lines. Thus, for instance, the railroad between Boston and Albany, is called the Western Railroad, when it should have been called "the Albany and Boston Railroad," and the Railroad stretching through the peninsula of Erie on the Canada side, is called "The Great Western Railroad." We confess that the latter is more appropriate than the former, but still it should have a local name. A number of other roads might come under the same catalogue.

Albany and Boston Railroad.

The double track of this road will be completed from Boston to Springfield, Mass., by next September. The amount of increased receipts on this road for the last quarter, was $26,000—a very satifactory result for the winter months. The whole number of shares in this corporation is now 51,500; the debt is five millions—making the whole cost $10,-150,000. Three millions more are wanted to complete the second track to Albany, and stock it properly with cars and engines, when it is calculated that the through business may be doubled.

A Good Project.

The Boston Traveller says that the anthorities of one of our Railroads, whose President is a thoroughly practical man, are organizing a system of cheap travelling, for the thousands in our city and outskirts, who are at present, in a measure deprived of healthful exercise of this kind, through lack of means. The plan is said to resemble cheap steamboats, &c., of London, who carry thousands of the working classes of that city, into the villages at the very cheap rate of from one to three pence each. This plan would enable hundreds and thousands of our working classes to make an excursion of five or ten miles, at an expense stated at three cents per head each way. It is also stated that the plan will be tried the coming summer. It will, without doubt, if fairly tried, be of great benefit to the people at large and profit to the originators.

North British Railway.

The North British Railway in Scotland of 58 miles in length, was about to be purchased by a single capitalist when the last steamer sailed.

Magnificent Steamer.

A magnificent Lake Steamer, to be called the "Empire State," is to be brought out next season, and to run between Buffalo and Chicago, and is to accomplish the trip in 60 hours. She is to be 310 feet long, with a breadth of beam of 37 feet, and 1650 tons burden.

Merrick, and Town of Philadelphia, have the contract for the engine, which is to be of the style and finish of that on the Isaac Newton, with a 76 inch cylinder, and a stroke of 12 feet: wheels 40 feet in diameter, buckets 10 feet face. She will have ample accomodation for 400 cabin and 1000 steerage passengers. In addition to the magnificent saloons and cabins, she is to have some 100 family and state rooms—all furnished in a style of magnificence and comfort.

Grasshoppers.

Some of the grasshoppers found in the Island of Borneo are as large as sparrows, and in Sir Edward Belcher's narrative of the voyage of the Samarang it is stated that a specimen presented to him by Mr. Brooke measured more than four inches in length, and was of a delicate grass green color.

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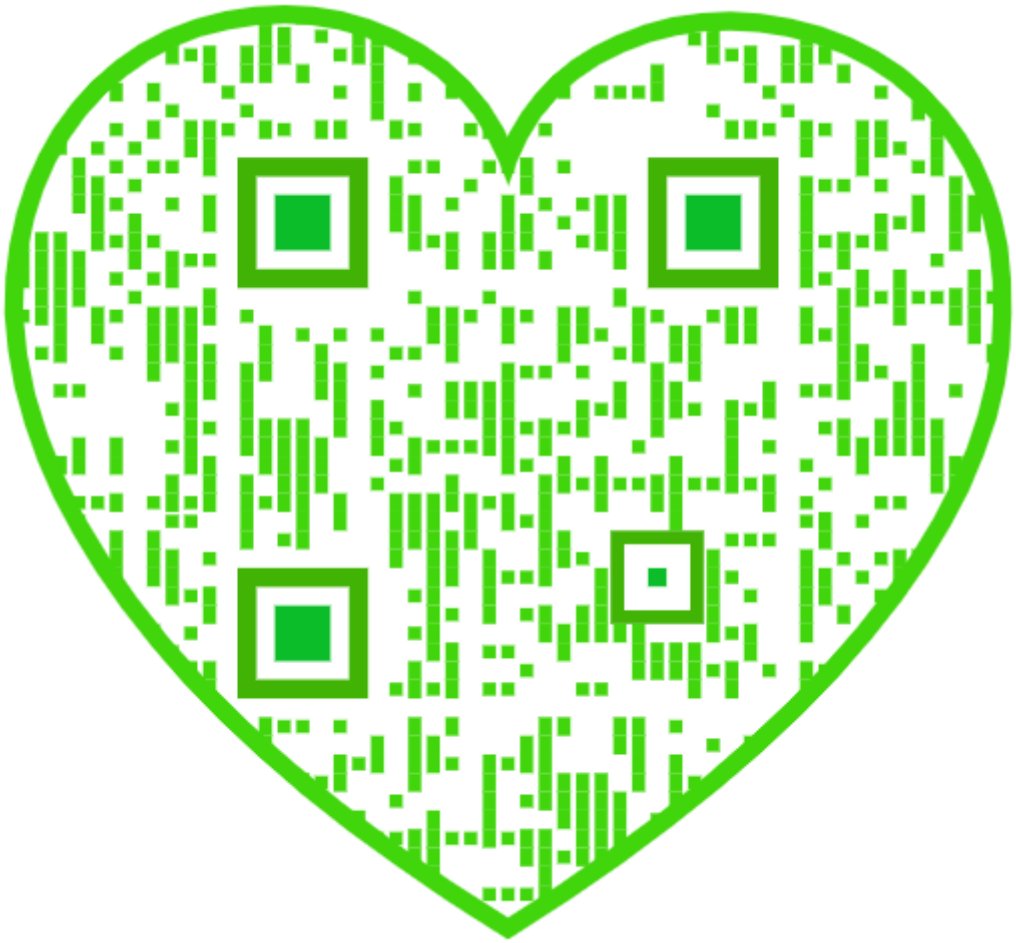

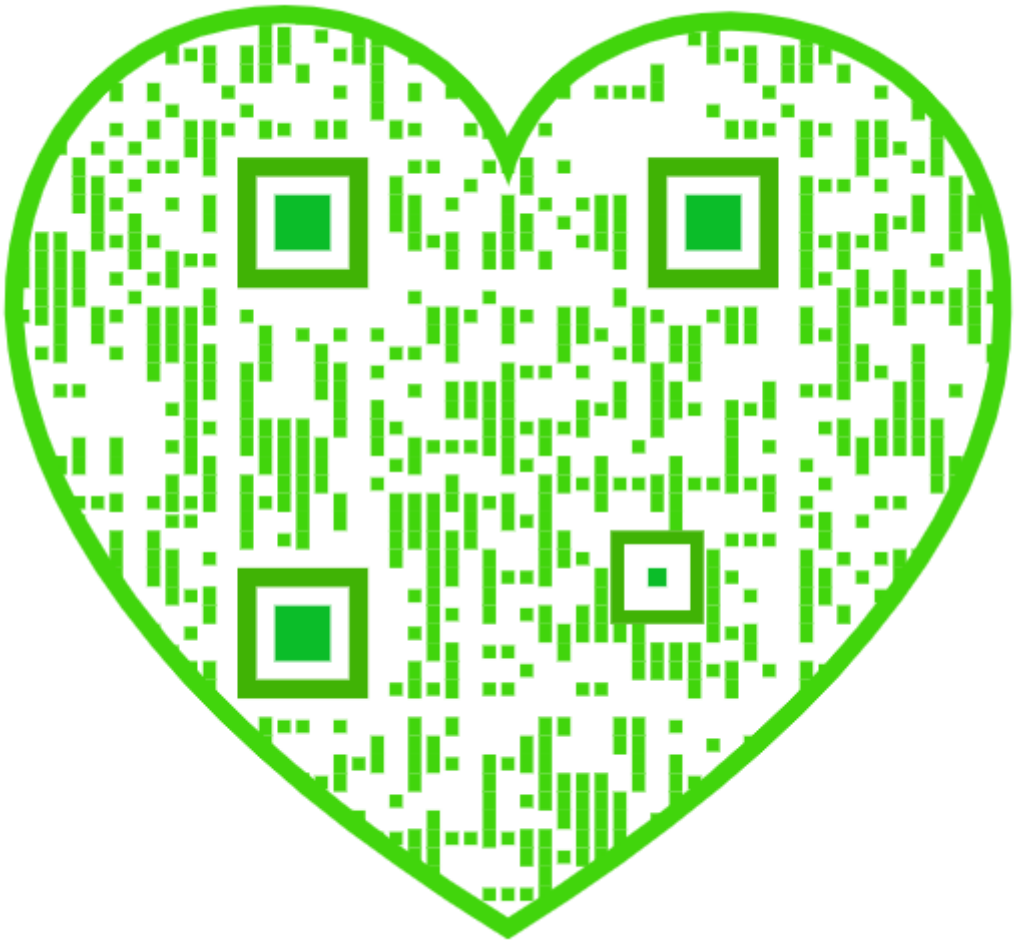

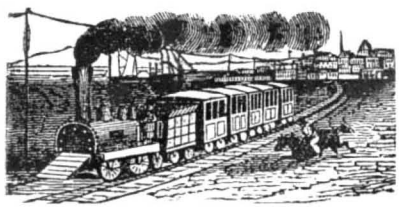

Western Correspondence.

Messrs. Munn & Co.—I should feel proud if in every workshop of my acquaintance your paper could be seen. But too many think the matter contained in it beyond their grasp.—There are not many mechanics here, but all are engaged. Nothing is shipped from this point in the way of manufactured articles, yet we have plenty of timber unsurpassed by any other in the world, and an immense water power on our rivers, having five locks and dams on the Green and Barren rivers without any machinery worthy of the age. It is a lamentable truth that many of our working men are without an education—even a common school education is voted down by the district majorities. Short sighted policy, that may in the South and West continue to curb our destiny for years. It is to be remembered, however, that most of the youth at mechanical trades are either orphans or sons of indigent parents, unable to *pay* for an education, or their own want of it makes them think so. J. M. D.

Bowling Green, Ky., March 12, 1848.

[Our worthy correspondent at Bowling Green has sent us a great number of subscribers both for this and the back volume. He is a man who thirsts after useful information, and wherever we find mechanics of this stamp we may be sure to expect, not in vain, some future distinction. We endeavor to be simple brief and plain in all our articles, looking to the benefit of our readers, although it is not possible in all scientific articles to keep clear of much that is abstract. We feel for the education of the mechanic and all the rising generation, and when this article reaches Bowling Green, we know that our subscribers there and the young men generally will feel that they should form a Mechanic's Institute and meet weekly and give their opinions upon useful subjects proposed for conversation. A good and kindly spirit and a zeal for mental and moral improvement, is an evidence of the true spirit of civilization.—Ed.

American Anthracite Furnaces.

From the Pottsville Emporium we learn that the Firmstone furnaces at Easton, Pa., have yielded in one week, viz. The 10 feet bosh stack, 102 tons ; in averages 93 tons ; the 12 feet bosh stack, 142 tons ; in averages 126 tons ; the Lehigh Crane Co.'s 18 feet stack, 168 tons ; in averages 150 tons. No furnaces in Europe have ever equalled this production. Peter Cooper has two 18 feet stacks in process of operation in New Jersey, opposite Easton. The rich magnetic iron ores of Jersey are brought to all these works by the Morris Canal. When their metal is for foundry purposes, one-sixth part of this ore is used in mixture with the leaner of the neighborhood. When forge metal is wanted, they use one third of the magnetic ore, which cheapens the cost of the metal.

Canada Gold Mines.

Gold ore has frequently been found by the peasantry near the Chaudiere River, below Quebec. Mr. Cunningham, a scientific mineralogist from the Southern States, has spent years in explorations, in the Chaudiere Valley, and Mr. De Levy reported most favorably. The ore is said to be rich and abundant, and a joint stock comyany has been formed to work the mines. The gold has been pronounced of the richest and purest quality.

Steam Boiler Explosion.

On Monday last a terrific explosion of an engine took place at a tobacco establishment in Philadelphia. The boiler burst in two parts dividing in the middle. Two lives were lost. The jury upon the inquest rendered a verdict expressing the opinion that both the owner and builder of the boiler were highly culpable, the boiler iron being scarcely an eighth of an inch thick, and being defective where it burst.

Daguerreotype. Discovery.

It is well known that the edge of the sharpest and most polished lancet, looks as blunt as the back of a case knife, and as jagged as a saw, in viewing it through a microscope.—The finest painting thus viewed becomes rough and uneven, and is entirely destitute of beauty of coloring or outline. It is not so with the photographic art. A professional gentleman of this city, a few days since, applied a microscope to a daguerreotype miniature, and to his surprise it became a life like "bust,' or cast, with the natural coloring of the hair, the eyes, and the dress, with the natural expression of countenance. The bust will appear as of plaster, of granite, or of Parian marble, according to the purity of the glass set over the picture.—To test this discovery, take a microscope—a watch maker's eye glass for instance—apply it to the eye, and in a proper light, range it at the true focal distance from the picture, and you have a view that is truly wonderful. It may be used to detect any imperfections of the picture not perceptible to the naked eye.

New Vegetable Manure.

A new description of vegetable manure has been received from Africa by Messrs. Keding & Hunt, of London, which is likely to become as important to the agricultural interest as guano. The article is called "Tremoco," or "Lupens," and it is said to be the richest vegetable manure discovered. It is sown the same as any other grain, and when tender, before or about blossoming, is dug up and spread on the land with earth, when it rots in two or three weeks, and the land becomes loose and rich for every agricultural purpose.

The Modest Admission.

The editor of the Farmer and Mechanic admits his incapacity and want of judgment, and has appealed to us for information. It is not possible to enlighten any person, who, like him, has his brain crammed with "*leaded* matter," and we must therefore leave him as we found him, incorrigible to advice or reproof.

New Engines.

The Philadelphia and Reading Railroad Company are building two beautiful engines for the new passenger train which they design running after the first of April. The morning line will leave Philadelphia and Pottsville at 7 o'clock—the afternoon line at 3 o'clock.

Telegraphic Improvements.

The Philadelphia Ledger says that the telegraphic line between this city, and Nashville Tenn., works admirably by means of the newly invented system of Messrs. Cook and Barnes, and the papers speak warmly in its praise. One advantage of the instrument is, that it dispenses entirely with the receiving magnet, which was generally deemed impossible.

The Louisville Courier says that the new telegraph invention for Mr. O'Reilly can print the Roman alphabet entire with one key, and with the same key, and at the same time, write the Morse characters.

Powerful Locomotive.

The Camden and Amooy Rail Road Company have placed, we hear, a powerful locomotive on their line, able to carry a train of cars, with ease, at the rate of 40 miles an hour We are very glad to hear this, as it will, doubtless, enable the Company, to get their passengers through next summer in time for the eastern boats.

Dosing Royalty.

The wonder is, how the royal personges can ever be ill at all, though, perhaps, the wonder is still greater that they should ever be well, considering the multitude of people who live only on the hope of regal stomachic derangements, and who are ready and willing to turn the whole pharmacopæia upside down if the Queen yawns, or her husband blows his nose with unusual emotion.

Deer Forest.

The largest forest set apart for red deer which exists in Scotland is the forest of Athol, where 100,000 English acres are given up to them. That land may be said to be very *dear*.

The French Revolution.

"The best laid schemes of mice and men,
Gang aft agee."

Never were truer words uttered than those of Robert Burns, the poet and never in the whole history of mankind could they be better applied than to the fate of Louis Phillippe, the King of the French. We well remember the time when he was elevated from a Duke to a Sovereign—sudden was his rise, as sudden his fall. The last steamer brought the news of his dethronement—his actual dethronement—not his abdication, that is all nonsense. Kings may abdicate as they choose, but there is only a single example of unforced abdication in all the history of monarchy.—We seldom trouble ourselves with political changes, but this much we can say of any monarch, that if he is good to his people, they will be a wall of adamant around him, if he is not good, neither armies, nor alliances with surrounding nations, can insure the crown of the father to be worn on the head of the son. We did not even dream that Louis Phillippe could have been touched by all the inhabitants of Paris.

To Fatten Green Geese.

A new mode has been discovered to fatten geese by the operation of animal magnetism, which bids fair materially to lower the price of the fowl tribe. Food sufficient for one is placed on the table among a whole flock, and the operator, (the old gander previously instructed in the art,) then mesmerizes the whole flock, and proceeds to satisfy his own appetite. The rest of course, from mesmeric sympathy, are satisfied when the mesmerizer is. By this means large flocks are fed with trifling expense.

Western Journal.

We have received Number 3 of this magazine devoted to Science and the Arts. It is published by Messrs. Farmer & Fisk, at St. Louis, Mo., and is a very valuable work. In it is to be found much information relative to the mining, manufacturing and agricultural enterprise of the Great west.

The Lost Children.

This is the title of a beautiful and affecting tale by T. S Arthur, an eminent and moral writer who is fast climbing up the ladder of fame. It is one of a series of tales published by Messrs. Oliver and Brothers, the enterprising publisher of the New York Organ.

Ohio and Mississippi Rail Road Co.

A meeting of the Directors of this road, for which a bill has passed the Indiana Legislature, is to be held at Vincennes, Indiana, on the 29th of this month. We hope that a prompt and thorough organization will be effected, as that road is yet going to be one of the best and most important in the Union.

New Winter Garden.

Edinburgh is about to borrow a hint from Paris in providing winter amusement. The Caledonian Horticultural Society propose to have a glass-enclosed winter garden, at first to be 140 feet in length by 35 in breadth; and afterwards enlarged, so as to admit of the most rare exotics, as well as to form a brumal promenade. The project is likely to meet with every encouragement.

The Cotton Crop.

The Commissioner of Patents estimates the cotton crop of the year 1847 at 1,041,500,000 pounds.

A bill has been under discussion in the Massachusetts Legislature to increase the capital of the Western Road $3,000,000. The Senate evinced a disinclination to give such an extended power of increase to this Corporation, and amended the bill giving power to increase $1,000,000. The bill was then passed.

Dr. Holland says, that if persons are always supposing that they are liable to a certain distemper, the nerves will so act on the part that it is very likely to come upon them.

The speculum of Lord Ross's Telescope is 6 feet in diameter. It can penetrate 500 times, at least, further than the naked eye.

The subject on the Pacific Railroad has been before the Committee on Railways and Canals of the Maasachusetts Legislature.

Moorhead's Galvanic Machines.

The graduated Magnetic Machines advertised in another column, we can recommend from personal knowledge to be the best article of the kind in use. We have sold various kinds and seen them used for the various maladies for which they were recommended, bnt we never sold any kind that gave so much satisfaction to the purchasers as do those manufactured by Morehead. Price 12 dollars neatly encased in mahogany and Rosewood cases. Address at this office where orders will be speedily filled.

Railroad Accident.

The train from this city to Philadelphia, last Tuesday morning, was precipitated into the Hackensack River, and one life lost. The accident occurred from the culpable carelessness, it is said, of the keeper of the bridge, who did not allow the proper signal to be displayed of the draw being open. The signals that are used on all the railroads are contemptible rags, which if they get wound on the flag staff, as the Hackensack Bridge one did, they are good for nothing. Large globes painted different colors should alone be used ; or else the lately invented stationary pneumatic whistle.

The mechanics and manufacturers of Baltimore announce to the public that they will hold an exhibition at Washington hall, in the city of Baltimore, on the 17th day of May next, for the encouragemant of manufactures and mechanic arts.

It is stated that the Graniteville Manufacturing Company of South Carolina will be ready to commence operations previous to the first of June next. The Factory itself is a building of some 350 feet in length, and built of beautiful granite quarried on the spot.

A memorial was presented to Congress on the 9th inst., from C. Evans, of Pittsburgh, Pa., praying that a law may be passed authorising the Government to purchase his patent right for the prevention of explosions on steam boilers.

A bald eagle, which measured eight feet between the tips of his wings, was shot by two sportsmen, in Barnstable, Mass., on Friday last. He held in his beak, when shot, a sheldrake, and in his talons, a water-witch.

Avoid all sourness and austerity of manners. Virtue is a pleasant and agreeable quality, and gay and civil wisdom is always very engaging.

The French spinners, says the Dublin Nation, are now large buyers in our flax markets. All the flax in Armagh market was purchased on French account.

A Missouri sportsman says he saw recently at the confluence of the Missouri and Charles rivers, one thousand turkies on a sigle roost.

The Burlington county, (N. J.) jail being without a prisoner, has been converted into a butchers shop.

In England, the practice of loaning newspapers is an illegal act, which subjects the lender to a penalty of $250.

The weathercock, after all, points to the highest moral truth, for it shows men that it is a vane thing to a-spire.

The number of chargeable letters in Britain, transmitted by post in 1839 was 76 millions; in 1847 it amounted to 322 millions.

Moustaches are recommended as a new object for taxation—a license to wear them at five dollars per annum would produce a fine taxation.

A number of artists from this City are going to make sketches of the Hudson for a grand panorama eight hundred feet larger than Banvard's.

A grindstone burst two weeks ago in Savery's foundry, Philadelphia, and severely injured a man standing beside it.

Mr. George J. Weaver, of Philadelphia, has just manufactured an immense rope for the inclined plane on the Philadelphia and Columbia Railroad. It weighs 2,500 pounds.

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The Carpet Manufacture.

(*Continued from our last*)

Mr. Whytock's method of producing his beautiful tapestry or "Velvet Pile Carpet," will be better understood by supposing a fabric to be printed with a pattern of any number of colors, it will be readily perceived that if a single thread were withdrawn it would at intervals have various parts of the pattern printed upon it. If, therefore, a hundred pieces of fabric required to be woven of that pattern having the yarn properly marked at intervals, one hundred lengths of such single threads would be needed and of every other thread to weave the hundred pieces. The pattern, therefore, to be printed, is simply to be drawn on *design paper*, and then all the threads which are to have the same marks of color are spread on the surface of a cylinder or drum, (such as I have described in the art of weaving,) and then by simply making marks of color at the intervals required, each set of threads will receive its particular element of the pattern, and in making up a warp one thread being taken from each set of threads the accumulation of the elements of the pattern thus brought about, would present a warp with the pattern on it as if it had been printed by blocks: the number of colors and the elaborate character of the design not altering scarcely a fraction of the cost of production. In this manner might any number of colors be used in the length of the pattern. Whereas in the Brussels Carpet the number of colors *lengthwise* in a design could not be more than *five*, without greatly increasing the expense; and practically, seven colors had proved to be the outside, and then the additional expense was not compensated by the result. Supposing then that there were five colors in a Brussels Carpet, only *one* of them would appear at at any one point, the other *four* being suppressed or hid in the act of weaving, and, therefore, the face of the fabric could only show *one-fifth* of the worsted yarn in the carpet, whereas by using printed yarns the whole might come to the surface.

The Brussels Carpet may be regarded as a series of carpets laid wastefully over one another—with this disadvantage too, that when the upper carpet wears out all the layers underneath become useless. To make one carpet if we may so speak, serve for the many carpets thus wrought over one another is the object of Mr. Whytock's invention. The question must have been often asked how this was effected; and the well known mode of printing calicoes must have been suggested as the antidote, but, the plan of stamping instead of weaving the pattern could never be brought to succeed. The surface of strong woolen thread raised into loops or cut open into bristly elastic pile, was not only injured by the block, but it failed adequately to receive from them the required pattern. Every attempt to print the Brussels carpet in England, Scotland, France, and Belgium has turned out a failure. Messrs. Pardoe, Hoomans, & Pardoe; of Kidderminster, England, lost £20,000 in undertaking it. Messrs. Crossly, & Sons, of Halifax, England, (who have now 836 of Mr. Whytock's improved machines in successful operation,) lost over £10,000, in fact, *it cannot be effected by blocks of any kind whatever*. If we snppose a pattern to be two yards in length, when woven up; the elements of that pattern will be twelve yards long on the warp grain before it is woven; the *looping* taking up *six* lengths of the warp yarn for *one* length of the pattern. This pattern, it will be perceived, then, would require as many blocks twelve yards long each as there were to be colors in the carpet; and if we allow *eighteen* colors for the carpet, (and which is a common number of Mr. Whytock,) we would be compelled to have *eighteen blocks twelve yards long, each*, to produce the pattern, and that portion of the pattern, for example, intended to be red, would have to be on one block, and all parts of the printing surface of that block not intended to print on the *red* color would have to be cut away; and so on with the other seventeen blocks. Now then let us see where we would soon find ourselves In the first place, those eighteen blocks would cost a little fortune, secondly, they would only answer for one pattern; thirdly, they would be continually warping, or getting out of order; and, lastly, the work done with such unwieldy implements would be liable to many imperfections.

On Mr. Whytock's plan of coloring the threads, (for he only colors a few at a time,) the pattern on the yarn will appear like a *lengthened shadow*, when all his colored threads are arranged side by side to form the warp. One set of Mr. W's workmen are employed in carefully barring across, with color, sets of threads spread on huge cylinders.—another set are engaged in fixing the colors,—a third in setting up the threads of the pattern as indicated by the design paper, to form the warp of the proposed web,—A fourth in weaving. All of them are *working in the dark*, so far as the pattern is concerned, they merely measure off certain *bars* of colors after given proportions: yet the pattern springs up before them complete in every sprig, leaf, and petal, as if it had been as much a thing of spontaneous growth as the mosses and wild flowers of the woods and moors.—Gilroy.

(*To be Continued.*)

Luxuries of the Olden Times.

The table luxury of the Romans commenced about the period of the battle of Actium, and continued to the reign of Galba. Their delicacies consisted of peacocks, cranes of Malta, nightingales, venison, and wild and tame fowls, they were also fond of fish. The reigning taste was for a profusion of provisions, whole wild boars were served up, filled with various small animals and birds of different kinds. This dish was called the Trojan horse, in allusion to the horse filled with soldiers. Fowls and game of all sorts were served up in pyramids, piled up in dishes as broad as moderate tables. Mark Antony provided eight boars for twelve guests. Caligula served up to his guests pearls of great value, dissolved in vinegar. Lucullus had a particular name for each apartment, and a certain scale of expense attached to each. Cicero and Pompey agreed to take supper with him, provided he would not order his servants to prepare anything extraordinary. He directed the servants to prepare supper in the room of Apollo. His friends were surprised at the magnificence of the entertainment. He then informed them that when he mentioned the name of the room the servants knew the scale of expense. Whenever he supped in the room of Apollo, the supper always cost 6,240 dollars. He was equally sumptuous in his dress. A Roman Prætor, who was to give games to the public, requesting to borrow one hundred purple robes for the actors, Lucullus replied that he could lend him two hundred if he wanted them. The Roman furniture in their houses corresponded with their profuseness in other respects. Pliny states that in his time more money was often given for a table, than the amount of all the treasures found in Carthage when it had been conquered by the Romans

Artificial Iceing.

An invention for generating ice by artificial means has just been discovered by Messrs. Lings and Keith, of Prince's street, the patentees of the ice-safe, &c. The ice is produced by means of a powder composed of salts, ammonia, and various chemical mixtures. This powder is placed in a simple apparatus, something in the shape of a churn, but smaller in size, and, being mixed with water, is kept in motion by a rotary process around the bottle of wine to be cooled. In a few minutes, and at a very trifling expense, the wine is sufficiently cooled, and if kept a few minutes longer in the vessel would be actually frozen. A bottle of water may be frozen to a solid, by this prolonged motion, but, of course it is not requisite to reduce the temperature of wine below a certain degree of coolness. The simplicity of the contrivance is one of the principal advantages of it, and the ease with which the effect is produced is equally beneficial. The most inexperienced in chemical experiments can produce the required results, which, in fact, require nothing but the labor of the hand for a few minutes.—*Times.*

Jewelry in the Infancy of the World.

Jewelery derives its name from the Hindostanee "joubour," a gem, and is of oriental origin. Jewels are the insignia of rank, th types of all the good sentiments that agitate human nature, the embodiment of every form of beauty that adorns the visible creation. Their use is as ancient a custom as any on record. The greatest of the earth have employed them, the wisest found pleasure in them, and the savage shows, in his admiration of them, a lingering connection with a former civilization, proving how deep a hold they have on human feelings. According to the character of the people, is the purpose for which jewelry is used.

In the early era of the world distinction of rank chiefly occupied attention. Wealth is generally the reward of superior moral or intellectual endowments; to its possessor is therefore transferred the respect that such qualities naturally command.

Wealth thus forms one of the steps to exalted rank, with its envied privileges and powers. Jewelry has always been the symbol of wealth, conferring on its wearer general homage. The costliness of its materials was one cause of its selection, and the earlier nations were content with such influence as the rudest fashioning could convey. Some knowledge of metallurgy must have been required in its simplest application by which the value must have been increased greatly when such attainments were rare. Bracelets of ten shekels weight, and a nose jewel, or ear-ring as our translation has it, of half a shekel, or nearly half an ounce, is the description of Jacob's present to Rachel. The mention of the weight implies that in the value of the material consisted the chief value of the gift. The improving ability of the artist introduced his labors into a new field of demand. Among a people whose literature was embodied in hyeroglyphics, in which the prevailing characters of animals were made the symbols or corresponding ideas, it is not surprising that the symbol quickly usurped the reverence due to the idea, when it is known that the operations of nature were ill understood, and the mixed results of unchanging laws were attributed to the caprice of particular divinities. The forms of birds, beasts, fishes; and insects became objects of devotion and their presence on the person of the worshipper, even when laid in the tomb, was considered essential to his safety and comfort in this world and the next; obedient to this religious demand the jeweler became a student of nature's forms, thus laying the foundation of that beautiful structure of art in its various departments, in which a source of pleasure is provided more healthful than the indulgence of the senses, such in short as benefits the temple of the imagination. The precepts of wisdom were accounted worthy of perpetual meditation, and the most enduring substances were used on which to inscribe mottoes, and to be worn as the amulets of life. —*Jones.*

Voracity or the Star-Fish.

The star-fish, too are common here, and I have a strange tale to tell of one. During the month of August the soldiers were in the habit of bathing in the sea every evening, and, from time to time, several of them disappeared, no one knew how. Bathing was in consequence strictly forbidden, in spite of which several men went into the water one evening. Suddenly, one of them screamed for help, and when several others rushed to his assistance, they found that a huge star-fish had seized him by the leg with four of its limbs, whilst it clung to a rock by the fifth. The soldiers brought the monster home with them and out of revenge they broiled it alive and ate it. This adventure sufficiently accounted for the disappearance of the other soldiers.—*The French in Algiers.*

Marriage.

Tacitus says:—"Early marriage makes us immortal. It is the soul and chief prop of empire. That man who resolves to live without women, and that woman who resolves to live without man, are enemies to the community in which they dwell, injurious to themselves, destructive to the whole world apostate from nature, and rebels against Heaven and Earth."

Ammonia.

BY PROFESSOR EMMONS.

This compound of nitrogen and hydrogen is exceedingly important in vegetation. Some of our most important grains require its presence. It exists in the atmosphere, and it is developed in the decay of animal and vegetable substances, from which it escapes in to the atmosphere, ready to enter into new combinations. One single property of this substance fits it to play its important part in the vegetable economy, namely, its ready absorption by porous bodies This property is manifestly proved in innumerable instances some of which fall under observation in our ordinary manual operations; for example, plaster, when placed in a stable, or in any place where organic matters are undergoing decomposition, takes up the ammonia as it escapes, lime also performs a similar office. A direct experiment, which proves this state ment, is often performed in the labratory; thus, we have only to pass a little plaster, lime, charcoal, earth, etc., into a receiver containing ammonia, over mercury, when the whole of the ammonia, disappears; it is absorbed and condensed in the pores of the body employed. Any moist substance whatever produces this effect instantaneously, so powerful is the affinity of ammonia for water. The same process goes on in nature; the ammonia floating in the atmosphere is continually absorbed by soil; by humus, and especially by clay; and all these substances give out their ammonia on the application of sufficient heat to dissipate their water. Exposing fresh surfaces of soil to the air, is one means of procuring a fresh supply of this matter. Clay and the oxide of iron contained in the soils, perform the important functions of absorption. The property of clay, is the one which renders clay soils so much better for wheat than sandy soils, it furnishes a supply of ammonia, from which the wheat forms its nitrogenous matters.

African Bridges.

I proposed to swim myself and horse across but this was opposed by the caboceer, on account of the rapidity of the stream. Besides, how were the officers wives who carried their baggage, and also my own carriages, to get across? For this purpose I proposed rafts to be made from branches of trees, cut into lengths and lashed together and passed across by a rope, formed from the long fibres which grow downwards from the branches of the large trees on this bank, resembling hundreds of ropes of various thicknesses. These extraordinary fibres are sometimes 30 and 40 feet long, according to the height of the branches from which they grow, and are extremely tough. They are pliable and of great strength. When they reach the ground they insert themselves some depth, and again take root, from which other trees spring upwards. They frequently form a colonade of considerable extent along the banks of the rivers and resemble mangroves. My proposition was not approved of, and a council of officers being held, it was in a short time determined to adopt rather a novel method, which it may be interesting to describe. As I have already stated. large trees of a species which I have previously mentioned, grew on the banks on either side of this river. A number of small trees were cut, each of the private soldiers cutting with his short sabre, or knife, till a sufficient number were thus obtained. These poles, newly cut, were tied to the long fibres hanging perpendicularly from the branches of the larger trees, and were then attached in succession, horizontally till they reach the hanging fibres of the trees on the opposite bank. After having fixed two lines of poles across in the manner I have described, about one yard apart, short pieces of wood were cut and placed across, and small boughs, and grass or reeds, placed on the top, so that a suspension bridge was thus simply constructed in the short space of half an hour. The whole party then passed over in safety. I was informed in reply to a question, that this was by no means an invention of the Dahomans, but has long been practised in Central Africa, especially in time of war, and where the rivers are not too wide floating bridges are also constructed in a similar manner, where the above method cannot be adopted.—*Duncan's Travels in Africa.*

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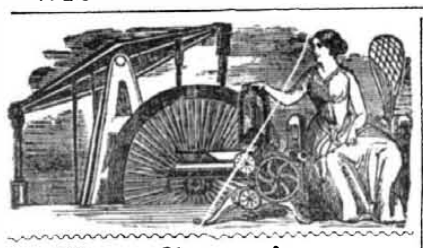


New Inventions.

A New Steam Engine.

The Cincinnati Dollar Paper says that Mr. J. H. Lanning, of that city, has "fitted up two small steam engines, in a temporary way, one a high pressure steam engine, the other a low steam condensing engine, on the Watt & Bolton principle. When in operation the low steam engine, though very imperfect in its construction, exhibited power equal to the high one. Not with steam from a boiler, but with steam from a reservoir of the escape steam from the high steam engine, which we had considered and pronounced an impossibility. The inventor asserts most positively, that he can furnish an engine on this principle, in place of the old one lately fitted up at the Water Works, and run it constantly with the escape steam from the two, (perhaps one) new engines, with as much power as the old one, now in operation can be run with steam direct from the boilers, 100 to 120 lbs. pressure to the inch, and now run at an expense of five or six thousand dollars per annum for fuel. Consequently the second engine on this principle, could be run all the time the other two are running, without any expense for fuel."

[This is the principle upon which all those engines called *Wolfe's high pressure and condensing engines, are constructed*, and it would give us pleasure to see them in more general use, as we are positive that they are very economical in fuel consumption.

New Power Loom.

Messrs. E L. Norfolk, Samuel S. Standly, and J. A. Marden, of Salem, Mass., have lately taken out letters patent for an entirely original power loom. It dispenses with the shuttle box, picker and picker staffs and is made so as to work at any speed without the shuttle flying through the shed. The shuttle is different from those in common use, being much smaller, and there is much less friction offered as a resistance to its operations. We trust to be able to present an engraving of it to our readers in the course of two or three weeks. We have heard that numerous offers have already been made to purchase rights of a number of Counties and States.

Stearine Candles.

Messrs. H. L. Kendall & Co of Providence, R. I., we learn from the Boston Symbol, have by experiments, discovered a method of separating the stearine from the oil of lard, and forming it into beautiful candles. A partial examination will hardly discover the difference between these candles and those manufactured from spermaceti. The candles are shaped by moulds, and can be furnished for market at two cents per pound less than spermaceti. A pound of each is estimated to furnish as much of clear and beautiful light as the other. Stearine candles are beautiful to burn as they emit very little smoke, and we cannot but welcome any invention so necessary to domestic comfort. The consumption of camphene is fast increasing in this city and other places, because it is so cleanly.

Telegraph Improvement.

The Louisville Journal says that Mr. Downing, an ingenious gentleman of that city, has invented a great improvement in telegraphing, which when perfected and used in connection with Morse's invention will secure invariable accuracy and greater rapidity, and that it may by a single wire do at least three or four times as much business as at present, and consequently render two wires upon one route unnecessary.

New Rotary.

A patent has been granted by the English government to Robert Wilson, of Renfrewshire, Scotland, for a new improvement in rotary engines to be worked by steam or wind, and also for an improvement in safety valves.

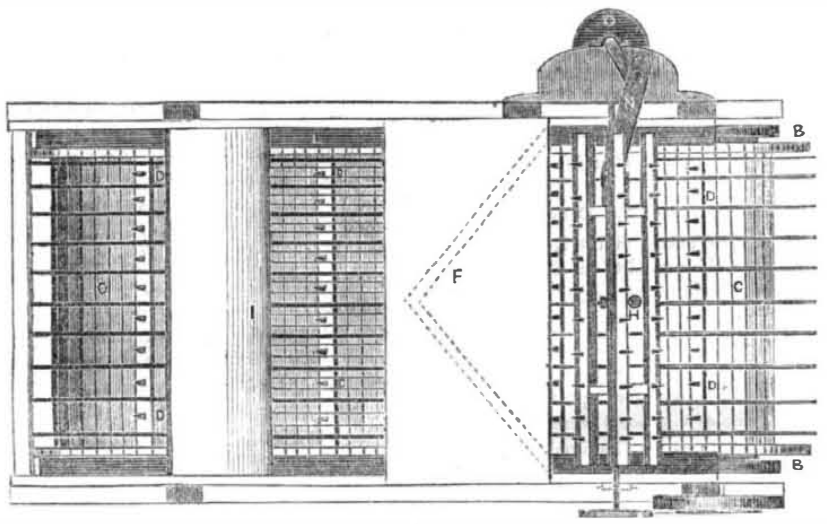
Whatever benefit the latter invention may be to community, we fancy that the former will not be of much advantage to any person.

Improved Power Loom Shuttle.

Mr. Richard Stiven, of Scotland, has recently registered, under the copyright amendment of Britain, a design for an improved shuttle, which bids fair to supplant all others, and to introduce quite a new era into the system of power loom weaving. The shuttle is of the same size as those now in use, but it contains two pirns or cops; and the beauty of the invention consists in the connecting the threads of the two cops together, so that when the one is exhausted the thread runs instantly off the other cop, from which it is thrown off continuously without a stoppage of the machine, until both cops are run out. The result is, that while by the shuttle generally in use, not more than nine inches of cloth can be worked without a stoppage of the machine, by Mr. Stiven's invention fully thirty inches can be so, on an average each of his shuttles being fitted to contain seven ounces of weft. By this means an immense saving of time will be effected—the stoppage in the manufacture of each piece being reduced one-half. In other words, upwards of an hour will be added thereby to the daily production of the loom, without a farthing of expense, and with diminished labor to all concerned. The weft is drawn out of the shuttle through an eye in the centre, and it escapes all risks of being thrown out of the lay.

WOODBURY'S IMPROVED GRAIN SEPARATOR.

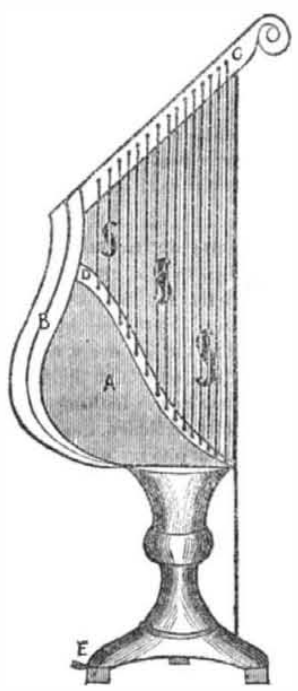
Figure 2.



This is a vertical view of the Separator, as seen by a person looking down upon the machine. The arrangements of the novel parts already mentioned are more particularly set forth in this cut. C, is the endless web. D, represents the cross pieces and the projections as they revolve in the channel slats, which are seen projecting inside of B B. H, is the arm that revolves the toothed roller G, in Fig 1, and N, is the crank, which is here exhibited but before described, to give the roller its side to side shaking motion to separate the straw. The roller or vibrating cylinder performs a very important office and it may be a concave seive covered with wire, but it is for the purpose of shaking the grain out of the straw, especially for large bunches produced by irregular feeding. We have therefore described the different parts and although they may appear to be complex, yet they are simple and very portable. The thresher discharges below the wire board, and the grain falls upon the web C, and is retained upon it by the rim and cross tooth pieces. F, is a shoe or point which compels all the straw and stuffs that come from the thresher to pass under it and be subjected to the action of the projections of the roller in separation. One of these machines has already performed extraordinary work, and the inventor has taken measures to secure a patent. As it regards price, &c. any person can gain further information either about this machine or Mr. Woodbury's horse power, by letter, post paid, to the inventor.

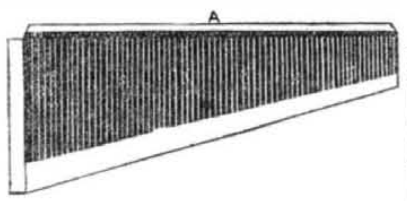
Improvement in Musical Instruments.

FIGURE 1.



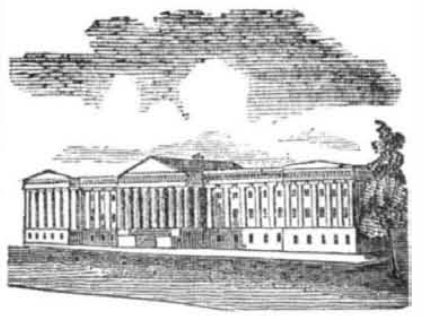
This instrument is a combination of the Harp and Guitar, the invention of Charles B. Clap, of Gardiner, Maine. The above engraving represents one side, and front of the instrument A, with the strings upon one side. The strings are made fast at the lower end D, and are tightened at the upper end C, like the harp. The other side has the same arrangement. The strings are about the same as those used by the harp. The instrument has an interior chamber like the violin, which is divided into two separate apartments B, and answer for sounding boards for the strings upon both sides. The same action is used for changing the keys as for the harp, said action being carried down to the base of the pedestal E, and operated by the feet upon pedals.—The inventor has one of these instruments completed which is most melodious,—having great volume and sweetness of sound, and any person who can play upon the harp can readily learn to play upon this. This instrument remedies entirely the only, and oft-repeated objection to the harp' " the want of a sounding board to reverberate the vibration of the strings."

FIGURE 2.



This is a vertical view of an improvement in Pianos This cut represents the sounding board. Instead of strings like those in use, Mr. Clap uses metallic bars, or teeth made upon the same principle as those now used in music boxes, and attached to that part of the sounding board marked A. They are to be operated with similar action keys to those used in the piano. The object of this improvement is to prevent the liability of losing tune and getting out of order, so common to a string instrument, the strings being so easily affected with atmospheric changes.

Townsend's Foundry, in Albany turns out a single casting every day of four tons weight.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending March 14, 1848.

To A. F. & J. Jones, of Lexington, Ky., for improvement in Cutting Boots. Patented March 14, 1848.

To J. Elnathan Smith, of New York City, for improvement in Propellers for Vessels.—Patented March 14, 1848.

To R. E. Monaghan, of Liverpool, Penn., for improvement in modes of taking Yeas and Nays in Legislative bodies Patented March 14, 1848.

To Robert Wallace, of New Haven, Conn., for improvement in the manufacture of Spoons. Patented March 14, 1848.

To John S. Trough and Joseph T. Craddock of Baltimore, Md., for improvement in Refrigerators. Patented March 14, 1848.

To Ebenezer Wilson, of Redding, Conn., for improvement in machinery for Dressing Combs. Patented March 14, 1848.

To John Mix, of Cheshire, Conn , for improvement in Spoons. Patented March 14, 1848.

To Edward A. Butts and R. F. Stevens, of Syracuse, N. Y., for improvement in Cooking Stoves. Patented March 14, 1848.

To Horace P. Russ, of New York City, for improvement in sub-strata for Pavements.—Patented March 14, 1848.

To Arvin H. Gazlay, of Saratoga Springs, N. Y., for improvement in Harness Saddles. Patented March 14, 1848.

INVENTOR'S CLAIMS.

Tanning Raw Hides.

To Halvor Halvorson, of Leicester, Mass. Improvement in preparing and hardening Raw Hides, (having assigned his right, title and interest in the said improvement to Timothy Earle ; and said Timothy Earle having on the 14th day of June, 1847, re-assigned the same to the said Halvor Halvorson) Patented 25th September, 1847. Claim.—What I claim as my invention or discovery, is the hereinbefore described process of treating the skin or hide of animals, or of thickening and converting it into a substance resembling horn, the same consisting in steeping or boiling it in an alkaline solution, an astringent solution, or an alkaline and astringent solution, and afterwards submitting it to the action of hot or boiling oil, substantially as specified. And furthermore, as it may not often be desirable to fill up or thicken the hide or skin, but simply to render it hard and semi-transparent, I claim to accomplish the same by steeping or boiling it in an alkaline solution, and afterwards in a hot or boiling, drying oil, as described.

Grinding Mills.

By Joseph Peirce, of Buffalo N. Y. Improvement in Grinding Mills. Patented 18th September, 1847. Claim—What I claim as my invention and desire to secure by letters patent, is the application by machinery of eccentrics upon shafts to the bridge trees of the spindles or the levers of transverse frames upon which the point stop or foot of stone spindles stand, and of straps connecting the pullies upon the shoes of the shafts of the mill hopper, so that by rotating the shafts by levers, wheels or pullies the eccentrics elevate and let down the bridge trees and shoes simultaneously and conveniently upon starting or stopping the mills.

West & Thompson's Clasp Coupling Joint.

We understand that this joint has been examined by a board of Naval Engineers, by order of the Secretary of the Navy, and they have recommended its adoption in the navy and at the navy yards.

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NEW YORK, MARCH 25, 1848.

The Original Inventor.

Many people suppose that by exhibiting evidence of an invention having been known to a private individual, and the same afterwards discovered and patented by another person, that the publication after the patent is granted of the private knowledge and use of the invention by the previous discoverer, will invalidate the patent. Such is not the case.—The discovery and private use of any invention even for a long time before a patent had been granted for the same discovery to another individual, will not injure the patent an hair's breadth. Dolland's patent for reflecting telescopes was held to be valid although it was proven that Dr. Hall reduced the same thing to practice in his closet long before, and Justice Story declared that "whosoever erects and uses a patent machine, does it at his peril, he takes upon himself all the chances of its being originally valid," and if a patent is surrendered to get a new issue for a defective specification, the erection of the machine by another person in the interim is an infringement of the patent right.

The Constitution of the United States gives Congress authority to grant patents for a limited term to promote the progress of science and the useful arts, consequently it extends its protection to those only that have been made known, either by application for a patent, or to that thrown open and published for the benefit of the public. An invention made known for the benefit of the public, cannot be patented by any individual, for Congress is bound to protect the rights of the public, and the reason why a patent is granted at all, is simply that an invention might come into public use, by a proper compensation to the inventor for the use of the same, for the inventor is bound to take reasonable measures to introduce his invention, if ever he would expect a renewal, and foreigners must put their patents into operation in the United States, within eighteen months after granted by our government, or the patent is forfeited.

Richmond's Patent Coiler.

This valuable improvement, for laying Cotton Drawing, or Roveing, and other fibrous substances in cans, has now successfully and generally introduced itself into most of our large and new manufacturing establishments throughout the United States. It is indeed a great labor saving machine, as well as a great saving of waste in pieceing of Drawings, thereby producing more uniform work, and a better article of cloth. This machine lays in the most perfect manner, eight times the quantity that is usually put into the same size of can by other machines, and it requires but little attention, as the cans are so long filling and emptying and discharging themselves in the most perfect manner, without lumps. They are now in operation in most of the factories at Fall River, New Bedford, Taunton, Canton, Lowell, Manchester, Saco, and we believe all new establishments, now starting, contemplate using this machine. We learn that the Metacomick Mill, Fall River, running 21,600 spindles, 504 looms, requires but three hands in taking the Drawing from the finishing Card and delivering it to the Speeder. We have tried to get drawings of this machine, and would request of the patentee to introduce it in some of our scientific papers, as many no doubt are ignorant of its importance, and where the machine or right to build can be had.

Evening Hours for Mechanics.

"What," says the North of Scotland Gazette, in an article in favor of the early closing of shops, "what have evening hours done for mechanics who had only ten hours toil? What in the moral, what in the religious, what in the scientific world? Hearken to these facts! One of the best editors the Westminster Review could ever boast, and one of the most brilliant writers of the passing hour, was a cooper in Aberdeen. One of the editors of a London daily journal was a baker in Elgin; perhaps the best reporter on the London Times was a weaver in Edinburg; the editor of the Witness was a stone mason. One of the ablest ministers in London was a blacksmith in Dundee; another was a watchmaker in Banff; the late Dr. Milne of China, was herd boy in Rhynie; the Principal of the London Missionary Society's College at Hong Kong was a saddler at Huntly; and one of the best missionaries that ever went to India was a tailor in Keith. The leading machinist on the London and Birmingham Railway, with £700 a year, was a mechanic in Glasgow; and perhaps the very richest ironfounder in England, was a working man in Moray. Sir James Clarke, her Majesty's physician, was a druggist in Banff. Joseph Hume was a sailor first, and then a laborer at the pestle and mortar in Montrose; Mr. Macgregor, the member for Glasgow, was a poor boy in Ross-shire; James Wilson, the member for Westbury, was a ploughman in Haddington; and Arthur Anderson, the member for Orkney, earned his bread by the sweat of his brow in the Ultima Thule." What an array of great workingmen. Like New England, the excellent parish school system of Scotland, has made her sons honored and renowned throughout the world. The evening hours of our young mechanics are more valuable than they are aware of, and it would be well if in our cities some better places of resort were to be found for the moral and mental encouragement of our young men. There are few who have had an opportunity of judging like ourselves, of the great necessity of good Mechanics Associations for our young men. Some such institutions as will woo them from the many snares and foolish wiles that lead them into folly and keep the mind dark for want of knowledge. We shall call attention to this subject again.

The Triumphs of Science.---Ultramarine or Lapis Lazuli.

This is a fine azure blue mineral and has been known in the arts from time immemorial. The rich and unfading blue of the ancient painters was made from this The finest specimens of it were brought fro China, Persia and Great Bucharia and the proposed pigment sold at an enormous price.

"But of all the achievements of inorganic chemistry," says Liebig, "the artificial formation of lapis lazuli is the most brilliant and the most conclusive. This mineral, as presented to us by nature, is calculated powerfully to arrest our attention by its beautiful azure-blue color, its remaining unchanged by exposure to air or to fire, and furnishing us with a most valuable pigment, Ultramarine, more precious than gold?"

The analysis of lapis lazuli represented it to be composed of silica, alumina, and soda, three colorless bodies, with sulphur and a trace of iron. Nothing could be discovered in it of the nature of a pigment, nothing to which its blue color could be referred, the cause of which was searched for in vain. It might therefore have been supposed that the analyst was here altogether at fault, and that at any rate its artificial production must be impossible. Nevertheless, this has been accomplished, and simply by combining in the proper proportions, as determined by analysis, silica, alumina, soda, iron and sulphur.—Thousands of pounds weight are now manufactured from these ingredients, and this artificial ultramarine is as beautiful as the natural, while for the price of a single ounce of the latter we may obtain many pounds of the former.

With the production of artificial lapis lazuli, the formation of mineral bodies by synthesis ceased to be a scientific problem to the chemist; he has no longer sufficient interest in it to pursue the subject. He may now be satisfied that analysis will reveal to him the true constitution of minerals.

(*To be continued.*)

Cholera.

The statements which have appeared in various quarters of the appearance of cholera in England are untrue. Cholic diarrhœa, and bowel complaint, or what is commonly called English cholera, have been very prevalent here and elsewhere. We have seen several receipes for the cure of these complaints, but their efficacy, in all cases, depends on the brandy and laudanum which form part of their composition. If medical assistance be not at hand, an adult patient, seized with bowel complaint, should immediately take from fifteen to twenty drops of laudanum in a little brandy slightly diluted with water. A gentleman has left us the following receipe which he assures us has been found very efficacious:—"Brandy, one table-spoonful, castor oil, one table-spoonful, ten to fifteen drops of laudanum, and two table-spoonsful of water." The Leeds Intelligencer publishes the following prescription:—"Two ounces sal volatile, two ounces laudanum, tincture capsicums seventy drops, and spirits peppermint ninety drops.—One teaspoonful to be taken in a little weak brandy and water, and repeat if needful."

A State Mechanical Repository.

Mr. Editor:—The remarks which appeared in one of the previous numbers of the scientific American concerning a plan for getting up a Mechanical Institute, for the purpose of giving every inventor his just claim and right, were in my estimation pungent and just, and expressed the feelings of almost all the inhabitants of this State. Such an Institution properly organized and honorably conducted would be beneficial to the inventors and to the community. It would help to deter all designing persons from hereafter attempting to impose upon the good sense of a discerning public. Mechanics are one of the most useful classes of society, and I think that their arts should be more thought of and their interests more advanced, and their rights better sustained in every honest and honorable way than they are. Numerous papers in our State are teeming with agricultural information and but little attention has been paid to the encouragement of mechanical skill or with the improvements in the mechanic arts. The mechanics themselves no doubt are much to blame but through your laudable efforts I think they will yet be aroused to a sense of duty and yet be elevated to their proper position. This State has an Agricultural Department at Albany, which is kept up at no little expense, and why have they not got up an Institute of Mechanical Arts in our capital. Is the genius which has linked the Erie to the Hudson, and which has made the railroad the highway of travel and the telegraph the highway of thought, of so little worth as to not have one word of encouragement from the State, not a single expression of gratitude for all the benefits and honors conferred by American mechanical genius. It is a shame for the people of this State, so much distinguished for mechanical skill, that we have no National Depository which proclaims "a national interest in our mechanical arts." It is with the farmer as it is with the mechanic, they are twin brothers, their occupations go hand in hand, the one cannot do without the other. I would therefore call the attention of them all to this subject, and request an equal share of attention and encouragement for one as well as the other. And why not have a Mechanical Institute in the State of New York? Yours respectfully,

D. B. Paine.

Paine's Hollow, N. Y.

[The Mechanics are beginning to be aware of the very thing so much wanted to elevate them.—Ed.

South Sea Improvements.

The Government of Honolulu has undertaken and completed many works of internal improvement. The water of a stream in the valley of Pauda, back of the town, has been conducted by lead pipes to a reservoir on one of the wharves, for the purpose of supplying fresh water to the shipping, which had long been a desideratum. The Brutus watered at this reservoir, which had just been completed and contrary to the predictions of many, the water has proved to be very excellent. The two streams crossing the road to Nunanu Valley, had been spanned by substantial arched stone bridges. Stone wharves and piers and a new Stone Custom House and a Court House were in progress of erection by government.

Missouri Copper.

A lot of 700 pounds of pure copper has been received in St. Louis, from the copper mines of Franklin Co., Mo. It is said to be very pure. The mine from which the ore was taken is about sixty miles from St. Louis, and in the vicinity of several large deposits of similar ores. There are in that vicinity and the country round about, indications of rich deposits of this mineral. Gentlemen of science and information, who have visited and critically examined the mines, say that the amount of ore is without limit, and that all the tests which have been made, show that it is of a very rich kind. The only drawback thus far has been the want of a proper mode of smelting the ore. That it is practicable. by the application of proper means, this experiment proves beyond a doubt; and that the ore is extraordinarily rich, is shown by the fact that by a very imperfect manner of smelting, it has been made to yield thirty per cent.

Kentucky Mines.

In Crittenden county, Ky., there are some lead mines producing ore yielding from eighty to eighty-three per cent of lead. The supply of ore promises to be very abundant. It is found in a vertical vein, in cube form, at a depth of from thirty to forty feet. Zinc ore said to be of a valuable and rare quality, is found in connection with the lead. The stock of this company is held principally in Boston, and the operations are under the exclusive management of J. C. Stickney, Esq. Only one furnace is in operation at this time, but preparations for working more extensively are in a state of forwardness.

Manufacturing in Virginia.

Measures have been taken for the erection of another cotton factory in the county of Jefferson, Va., to manufacture colored cotton goods, by the purchase of the Hopewell Mill, upon the Shenandoah river, six miles from Harper's Ferry. One half of the amount of capital that will be required, is already subscribed.

Disinfecting Fluid.

The disinfecting fluid of Sir William Burnett, of England, has entirely failed to produce the results claimed for it, at least in Canada. Two agents sent out by the British government to experiment at Quebec, have become victims to the fever, one died and the other has returned to England. The substance used was chloride of zinc, and, like chloroform, it was when first discovered to be a preventive for all disease, but alas, these things but help to give stronger force to the sad memento, "man is of few days and full of trouble."

The Death of Dr. Jones.

The National Intelligencer of Monday announces the death in Washington, on Saturday the 11th. inst., of Dr. Thomas P. Jones, formerly superintendant of the Patent Office, and Editor of the Franklin Journal of Philadelphia, aged 75 years. Dr. J. was one of the ablest scientific men in our country.

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For the Scientific American.

The Electric Telegraph.

Chronological history of the science of electricity—the discovery and improvements made in it for the last two hundred years, down to the magnificent adaptation of it to telegraphs, by Professor Morse.

No branch of experimental philosophy has been so much neglected as that of electricity; indeed, until the 17th century, little or nothing was known of it.—In the year

1600.—Mr. Gilbert, of Colchester, published a treatise in Latin, of various experiments made by him; but his theory was very imperfect, though he increased the number of electric bodies, and also of substances upon which electricity would act.

1630—Nicolaus Caboeus, at Terrara, repeated the experiments made by Gilbert, and made some progress in adding to the list of electrics.

1670—Mr. Boyle made some discoveries which escaped the notice of his predecessors.

Otto Guericke, of Magdeburg, (inventor of the air-pump,) made some advances, and was the first to discover, that a body once attracted by an excited electric, was repelled by it, and not again attracted until it had touched some other body.

Dr. Wall, about the same time, observed light and sound produced by rubbing pieces of amber with wool, and experienced a slight shock.

1675—Sir Isaac Newton gave to the royal Society an account of similar experiments made by him.

1709—Mr. Hauksbee distinguished himself by discoveries in electrical attraction, and the repulsion of the electric light. After his death, very little was done for twenty years.

1728—Mr. Stephen Grey, a pensioner at the Charter House, and his friend, Mr. Wheeler, made a great variety of experiments, and discovered that electricity might be communicated from one body to another, even without those bodies being in contact.

1733—Du Fay, of France, repeated the experiments of Mr. Grey; but added little or nothing of his own.

1834—Mr. Grey made experiments upon iron rods, from whence came the term "metallic conductors."

1739—Dr. Desaguliers made several experiments.

1742—Mr. Boze, Professor at Wittemburg, and other Germans made experiments. Mr. Winckler used a cushion, instead of the hand to excite the globe. Mr. P. Gordon a Benedictine monk, and Professor of Philosophy at Erford, was the first to use the cylinder instead of the globe. With his machine, he conveyed the fluid along wires of 300 ells in length, and killed birds. Dr. Ludolf, of Berlin in 1744, made some experiments. Mr. Boze fired gunpowder by electricity. Mr. Gordon made the electric star. Mr. Winckler, by the agency of electricity made a wheel to move.

1745—Mr. Collingston sent to Philadelphia an account with these experiments, with a tube and directions how to use it.

Franklin, with some of his friends, immediately engaged in a course of experiments, the results of which are well known. He was enabled to make a number of important discoveries—proposing theories, accounting for various phenomena, which have been universally adapted, and bid fair to endure for ages.

Several experiments were made in Holland and Germany.

Dr. Miles, of England, fired phosphorus by the application of the excited tube itself, without the intervention of a conductor.

Dr. Watson fired air, made inflammable by a chemical process, and discharged a musket by the electric fluid. He made many other experiments.

Mr. Cuneus, of Leyden, made the discovery of the famous "Leyden Phial;" and Mr. Von Kleist, dean of the cathedral of Camin, is said to have discovered it about the same time. By this discovery, electricity could be accumulated, and very severe shocks be given.

Mr. Gralath gave a shock to twenty persons at once, and at a considerable distance from the machine. He constructed the electric battery, by charging several phials at once. Mr. Winckler, and Mr. Monnier in France, transmitted the electric fluid through several feet of water, as a part of the circuit. Mr Nollet, in France, killed birds and fish by the discharge of the Leyden jars. Improvements were made by Dr. Watson and others in the Leyden phial, by coating the inside and outside of it with tin foil. The Abbe Nollet gave a shock to 180 of the Guards, in the king's presence, and to the whole community of the Grand Convent of the Carthusians, in Paris, by means of wires between them, forming 3600 feet in length. The same experiment was tried in France, through a circuit of persons holding wires between them for 3½ miles. In another experiment the water in the basin of the Tuilleries was made a part of the circuit.

Mr. Monnier, the younger, to discover the velocity of electricity, discharged the Leyden phial through an iron wire 4,000 feet in length, and another of 1,319 feet, but could not discover the time required for its passage.

(*To be continued.*)

The Anæsthetic Agents.

Professor Brandt delivered a lecture recently before the Royal Society in London, on the subject of the recently discovered anæsthetic agents, ether and chloroform, to a numerous audience in the theatre of the institution, Albemarle-street. The learned professor began by observing that ether was first noticed about the year 4,540 by the pharmacetical chemists, but it received its present name in a paper which appeared in the "Philosophical Transactions of the year 1730," which was supposed to have been writen by an assistant of Boyle's. Its properties were investigated by Newton, and its discovery was ascribed to him. Berzelius and Liebig invested the theory of its composition. Chloroform was noticed by Liebig, and its composition was investigated by him and Dumas. One atom of ether was composed of 4 atoms of carbon, 5 of hydrogen, and 1 of oxygen; 1 atom of chloroform was composed of 2 atoms of carbon, 4 of hgdrogen, and 3 of chloride. They were both derivatives of alcohol. The specific gravity of ether was about 616 or 617, it boiled at a temperature of 96 it was never frozen, but it produced a great degree of cold. Its weight as compared with air, was 2 1-2 to 4. The products of its combustion were carbon and water, when ignited by flame, but if burned without flame, it produced a very pungent acid. Chloroform boiled at a lower temperature than ether; its vapor would burn if heated very highly, but if mixed with spirits of wine, burned very readily, and emitted smoke, and a strong muriatic acid. It was extremely dense and heavy. Such were the principal characteristics of these two bodies. Now, with regard to their physiological effects. If fifty per cent of ether was mixed with air, it could be breathed. But the ether must be pure, because, if impure, it produced great irritation and coughing. On breathing a mixture of this kind s series of very curious phenomena arise, which are very beautifully arranged by Dr. Snow into three or four classes. In the first stage an agreeable and exhilarating effect was produced, which did not render us insensible to pain or make us unconscious of what we were doing. In the second stage the mental functions and voluntary actions were irregularly performed: persons were unconscious where they were, but they generally did what they were requested to do, though sometimes in this stage they were obstinate and very intractable. This was the principal stage of dreams, when they passed rapidly and vividly through the mind. A person would not be insensible to pain in this stage, though in passing to the first stage he would not probably remember what he had suffered. Persons could not be operated upon in this stage in consequence of the involuntary struggling with which it was attended. In the third stage, the mental functions, and consequently voluntary motion became torpid; but muscular motion might take place as the result of external impressions. Respiration went on regularly. If a person was spoken to or roused he might be made sensible of what was going on, but generally he lay still, and if sitting on a chair he had a tendency to fall off. The limbs were sometimes contracted in this stage. Persons may moan while in it, but they never uttered articulate sounds. In the fourth stage there were no movements except that of respiration; the muscles were relaxed, the eyelids drooped, the pulse was quick, the breathing stentorous, the countenance placid, and possibly persons were insensible to every degree of pain. They never snored till in this stage, and they were entirely insensible to what was going on. If the process of inhalation was discontinued, the person relapsed into the third stage in the course of three or four minutes, and so on from the third to the second and first. The fifth stage was only witnessed in the inferior animals, and was productive of death. Chloroform produced the same degree of narcotism as ether, and caused analagous effects. It entered into the blood, and with the blood passed to the brain and there produced the effects he described. He would not enter into the question whether a person might not feel pain in the fourth stage, although he might not afterwards remember it. This was an interesting question, but it belonged to metaphysics rather than to physics. Another very important question, which, however, did not come within his view, was, what were the advantages of the two agents—was one more safe or more dangerous than the other. He believed that all the evidence they had, went to show that Chloroform was more dangerous—at the same time it was more manageable. It was more dangerous because it was more powerful, and an over-dose of it might be given more easily than of ether. In all other respects chloroform must be preferred. It was sweet, it produced its effects more rapidly, and caused very little suffering in administering it. The question of the respirability of these vapors was very important, and when combined with the singular and marvellous influence which they had on the vital energies and the management which they possessed over them, it announced the approach, if not the arrival, of that long-wished for era in phisiology and surgery, when so many of the pains that afflicted humanity might be removed. The effects of these agents should teach them also that no new discoveries in chemistry should be called useless because, trifling as they may seem, one of them may do for chloroform what chloroform has done for ether.

The Green Frog of Australia.

In the Macquarie, near Bathurst, I first saw the superb green frog of Australia. The river, at the period of our visit was for the most part a dry bed, with small pools in the deeper holes, and in these, among the few shining water plants and confervæ, dwelt these gorgeous reptiles. In form and size they resemble a very large English frog, but their color is more beautiful than words can describe. I never saw plant or gem of such bright tints. A vivid yellow-green seems the ground-work of the creature's array. and this is daintily pencilled over with other shades—emerald, olive, and blue-greens, with a few delicate markings of yellow, like an embroidery of gold thread upon shaded velvet. And the creatures sit looking at you from their moist floating bowers, with their large eyes expresssive of the most perfect enjoyment, which, if you doubt while they remain still, you can't refuse to believe in, when you see them flop into the delicious cool water, and go slowly, stretching their long green legs as they pass through the wavy grove of sedgy feathery plants in the river's bed: till you lose them under a dense mass of gently waving leaves. And to see this while a burning, broiling sun is scorching up your very life, and not a breeze is stirring, and the glare of the herbless earth dazzling your agonized eyes into blindness, is enough to make one willing to forego all the glories of humanity, and be changed into a frog.—*Mrs. Meredith's Australia.*

Difficulties of Ice.

The king of Siam said to the European, who told him that the rivers in his country were sometimes made so hard by cold, that the largest elephants could walk upon them "hitherto I have believed you, because I thought you a man of truth; but *now I know you lie.*

More about the Substitute for White Lead in Painting.

On the substitute for white lead in painting which we gave a notice of in our last number, we have received the following report made at a late session of the Academy of Arts in Paris:—

In 1835 M. Leclaire, a house painter, having witnessed the ravages that white lead made among the workmen engaged in his business, set himself to seek some white substance, which could take the place in the arts, of the poisonous article which had been heretofore used After having examined all the white substances which nature offers, he finally arrived at the white of zinc, and he discovered that this oxyde had all the qualities of the white of lead without having any of its inconveniences.

Whiter than the white lead, the oxyde of zinc reflects the light instead of absorbing it, gives a finer tone, and covers better the surface on which it is spread. Moreover it is not subjected to any of the action of the sulphurs, which blacken so quickly paintings in white lead. Finally, and it is the capital point, the preparation and use of it do not in any way affect the health of the workmen.

After having assured himself that the mechanical preparations of the white of zinc might be realized in an economical manner, M. Leclaire was desirous to complete his invention by replacing, on the painter's pallet, all the colors of which lead makes a part, by other articles of which zinc will be the basis. In this difficult enterprise, he has had, as far as we can now judge, the most complete success, and the inventor of white zinc has filled up the gamut of unchangeable colors by the substitution of stable and inoffensive colors for those which have copper and lead for the basis. He has even succeeded in replacing the driers, of which litharge always forms a part, by a substance the properties of which are equal to it, and which only contains manganese.

The harmlessness of all these substances seems to be demonstrated, now, by decisive experiments. M. Leclaire employs constantly in all the different quarters of Paris, two hundred workmen, in the application of his colors. Among them are several who had been compelled to leave off their trade in consequence of suffering from the painter's colic, None of them have felt the least inconvenience from the use of the new substances.—The workmen employed in the manufacture of the zinc white, have also presented none of the phenomena of intoxication, notwithstanding the imperfections which necessarily result from a temporary arrangement.

As to the superiority of the new colors in reference to their stability, the curious experiments presented by M Arago leave no doubt in this respect. It is enough to quote one.—After having covered the two halves of a board, one with the colors of M. Leclaire, the other with those which are still used by painters, the surface was exposed to the uniform action of a current of sulphuric hydrogen. The first half preserved all its freshness, while the second immediately turned black. If this durability of the colors prepared by M. Leclaire does not make the greatest merit of his invention, it may, nevertheless, be considered as a very important circumstance. What is there in fact more precious to preserve, a ter the life of man, than that of the works to which genius has given birth, and is it not a valuable present to make our painters, that of placing on their pallets, colors that time cannot change.

Free Translations.

A Parisian author has translated Shakspeare's line: "Out, brief candle," into French thus: "Get out *you short candle!*" That is'nt as bad as the translation of an exclamation of Milton's by a Frenchman, who rendered "Hail horrors—hail, thus: "How d'ye do horrors—how d'ye do?" Nor yet as bad as a compositor in this city, who put these two lines of Bryant's apostrophe to Truth,

"Truth crush'd to earth shall rise again,
The eternal years of God are hers,"

given him in manuscript, into type in this fashion,

"Truth *mush'd* to earth shall rise again,
The eternal *ears* of *Tod* are *hats!*"

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TO CORRESPONDENTS.

"J. M. D. of Ky."—You will see a table of a Metallic Bath for tempering tools, in No. 23 of this volume of the Scientific American. Your friend's plan may be different. That table was arranged and prepared by us while attending the Mechanical and Chemical Lectures of Professor Stewart.

"W. M. H. of N. Y."—Two weeks ago we were informed that the examinations at the Patent Office were commenced for those made in the early part of June last.

"G. L. of N. Y."—In next number you will see an article on Starch. We have corrected the mistake.

"J. M. M. of N. Y."—Wrought iron blinds are not uncommon here, but no patent can be secured for the application merely of a different material to a known purpose. The French Patent Laws cover cases of this kind but not those of any other nation.

"J. H. of Craigville."—A cut of your Regulator will appear next week.

"G. P. of Washington."—We will answer you by mail.

"R. R. of Geo."—Regarding Parkhurst's machine, we have also been endeavoring to get the same information for another person, and in all likelihood will obtain it next week. There has been a suit relating to the invention.

"M. M. S. of Mo."—Your idea regarding the great heat communicated to the water without evaporation, by the pressure of the steam, is correct, and is one which we have not heard advanced before, but the mercury guage and regulator, is now in common use on all good engines.

"T. S. of Ky."—So far as we have been able to examine, no such bee-hive as yours has been patented.

"H. B. A. of N. Y."—Hope that you will give an account of the wheel, after repeated observations,—such information is valuable to the community It is the only data on which to depend.

"J. H. of Mobile."—Address E. Robbins, Syracuse, N. Y., post paid, and all information will be obtained. The cost is nc more than for another lathe.

"J. C. of Mass."—A cut for your improvements in loom will be $7

"S. K. M. of N. Y."—An engraving for your invention will be $4. It is the best way to get an invention before the public. There are plenty of good inventions covered with a patent, that are dead to the world, and to the inventor. The only way to let them be known to community is to publish them in the Scientific American. Its large circulation will scatter a knowledge of your invention over the Continent.

"L M. W. of N. Y."—We are much obliged to you for your interest in the Scientific American. We have sent Mr. B. the prospectus.

"J, G. of Mass."—We can see nothing to hinder you from securing a patent, for the combination, but not for the shape of the jack. A new form is a design, and simply refers to that particular shape and no more.

"J. D. K. of Penn.—We shall publish our views on lead pipes, in next number of the Scientific American.

"W. & P. of N. Y."—It would not answer for us to engage in an arrangement you speak of. The scythe improvement is new. The bellows action is known and has been used but not economically.

"S. D. P. of Mass."—Your improvement in lightning rods, is beautiful and useful. We should like for you to get a cut of it published.

"J. D. of Boston."—If you will send us 50 cents we can forward to you one of those sheets.

"J. S. F. of Va."—We cannot furnish you the first Volume in sheets but we have sent the second complete, and all of the present nos, that are yet published, and credited you, for one year and a half in advance.

"J. F. G. of Ohio."—Your money is received.

"J. B. of Ms."—We can furnish you with a beautiful engraving of your machine for $6

"T. J. of Geneva."—We have answered you by mail, also Messrs. G. & L. of Troy, and E. B. of Manchester.

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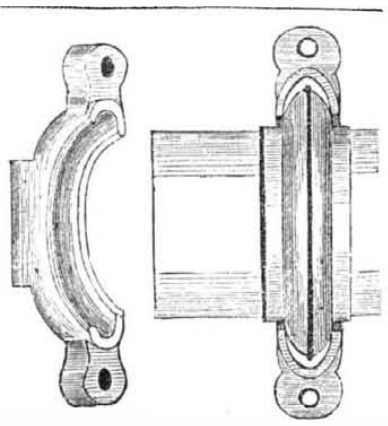

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This is to certify that I have examined what is called West & Thompson's Clasp Coupling Joint, for pipes to conduct steam and other fluids, and consider it to be a new and most invaluable improvement.
m25 ROBERT L. STEVENS.

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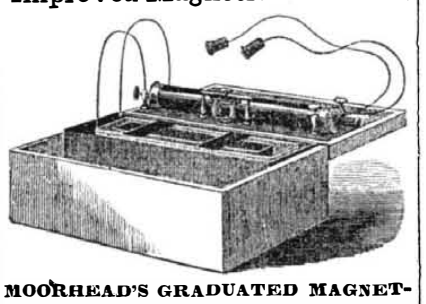

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To Mill Owners.

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2 1-2	17	5 1-2	40	9 1-2	73
2 3-4	19	6	45	10	80
3	20	6 1-2	49	10 1-2	85
3 1-2	26	7	57	11	90
3 3-4	28	7 1-2	58	11 1-2	95
4	29	8	63	12	100
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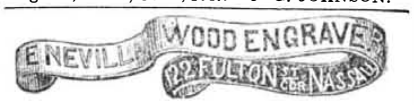

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For the Scientific American.

Metallic Alloys.

The specific gravity of copper is 9 nearly. It melts at a temperature of 1996° Fah.

Tin has a specific gravity of 7.5 and it melts at a temperature of 442.

Zinc has a gravity of 7.7, and melts at 773. At a temperature of 300 zinc becomes extremely malleable and may be drawn into thin leaves, or fine wire and one of its latest and most valuable applications is its use as a protective covering for iron, being the best known substance for this purpose, and which has given iron so treated the name of "galvanized iron." Copper and zinc in combination produces valuable alloys in the arts.

For sound copper castings, to one pound of copper after it is melted, add half an ounce of zinc—this added at the lowest temperature of the molten copper. After this is cold, it is all the better to be re-melted gradually, by placing the crucible with the alloy in the fire almost as soon as it is kindled. All alloys are the better to be thus treated, stirring well.

Gilding metal for jewellers and other alloys, to one pound of copper add one ounce zinc; for red brass add 2 ounces of zinc; for pinch-back add 4 ounces of zinc; for ship sheathing 10 ounces of zinc, and for soft spelter solder 16 ounces of zinc, that is pound to pound of copper and zinc for the latter. Zinc, however, is so volatile that the foregoing proportions can scarcely be adhered to for correctness, but a slight variation of parts does not affect the mixture. These alloys are varieties of brass which are applied, and always have been, to so many different purposes in the Arts.

Copper and tin alloys are made in the same way as zinc and copper. To one pound of copper for soft gun metal, add one ounce tin; for mathematical instruments add 1 1-4 ounces tin; harder for wheels, add 1½ ounces tin; for brass guns add 3 ounces tin; for hard bearings for machinery add 2½ ounces tin; musical bells, add 3 ounces tin; Chinese gongs, add 3½ ounces tin; for small house bells, add 4 ounces tin; large bells, domestic, add 4½ ounces tin; large church bells, add 5 ounces tin; for speculum metal, 8 ounces of tin are added, and for pewter 32 parts of tin are added to one pound of copper. Sometimes for peculiar purposes zinc, or silver, or arsenic is added, but the above are the best proportional parts in use at the present time. Tin and copper make a far harder alloy than either of these metals separately. An alloy can be made so hard that it is utterly devoid of malleability, and cannot be acted upon with a file.

For the Scientific American.

Practical Papers for Amateur Artists.

OILS.

The longer oil is kept, it is always the better, both in regard to its drying and transparent qualities. To make good nut oil the walnuts should be peeled of their skins, as the skin contains an acid oil which turns it brown. Poppy oil is made from the ripe seed of poppies pressed like the walnuts. It is the best drying oil. The oil of spike or lavender, is obtained by distilling spike with water. It is very volatile and fine for enamel work and for working with the pencil.

DRYERS.

Boiled linseed, sulphate of zinc, sugar of lead, seedlac, gum mastic, sandarac, gum anima, copal, umber, litharge and red lead.

For fine painting, to make a fine drying oil, take of poppy oil, or nut oil, one pint, of gum sandarac two ounces, of white vitriol and sugar of lead one ounce each. Boil the whole till the solid ingredients be dissolved and the mixture be of the color of linseed oil. This oil will dry fast and mixed with an equal quantity of nut oil and a portion of pure turpentine, it is fine for use when the purest white tint is not required. It will also, when mixed with the other oil, render it capable of drying well without fattening and it may be used for fine purposes, where common drying oil would be injurious from its color.

GLOVER'S SIZE.

Take fine shreds of white sheep skin and for each pound a gallon of water and boil it for 8 hours so as not to diminish below two quarts, add for this purpose water as it boils down. Then take it off the fire and strain it through flannel while hot, and afterwards evaporate till it becomes like a jelly when cold.

SUGAR AND SUGAR CANDY.

Sugar and white sugar candy are used to render water a vehicle for colors in miniature painting. The intention is to prevent colors from cracking that are mixed with gum arabic. This renders gum capable of working more kindly with the pencil and it does not dry so brittle as the gum singly.

Starch is also used in gum water to make it work more freely in painting and prevent cracking. Some think this a great secret.—Isinglass is also a good vehicle for colors, like gum, but it is better for standing dampness after it is dry.

Seedlac is also used in painting. It will mix with pure spirits of wine (alcohol) and when it is wanted pure, the white seeds must be picked out and well washed and powdered, and then dissolved. Shellac is also used and dissolves in the spirit of wine.

Gum mastic and sanderac are white and are also used for water colors, but they are apt to melt with heat and when used for painting should be mixed with seedlac.

White resin, which is the result of turpentine that is distilled with water, makes a good varnish dissolved in alcohol.

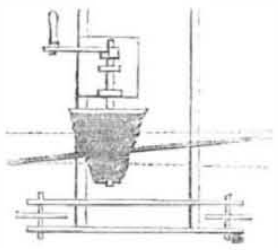
The Function of Leaves.

The leaves of plants and trees perform the same offices in the vegetable kingdom, that the lungs and pores of the skin perform in the animal. The sap that is drunk up by the roots of a tree and ascends through all the ramifications of the tall trunk, or stem, or branch by a more curious arrangement than is yet to be found in any of the arts when it reaches the leaf it is given forth again to the atmosphere by means of a particularly beautiful economy. The quantity of moisture produced by a plant is hardly dreamed of by those who have not specially informed themselves. The experiments of Hales have been often quoted. A sunflower three and a half feet high, presenting a surface of 5.616 square inches exposed to the sun, was found to perspire at the rate of twenty to thirty ounces avoirdupois every twelve hours, or seven times more than a man. A vine of twelve square feet, exhaled at the rate of five or six ounces a day.—A seedling apple tree, with twelve square feet of foliage, lost nine ounces a day. These are experiments upon very small plants.—The vast amount of surface presented by a large tree must give off immense quantities of moisture. The practical bearings of this fact of vegetable exhalation are not a few.—Wet forest lands by being cleared of timber become dry, and streams fed from such sources become almost extinct as civilization encroaches on wild woods. The excessive dampness of crowded gardens is not singular, and still less is it strange that dwellings covered with vines, whose windows are choked with shrubs, and whose roofs are overhung with branches of trees, should be intolerably damp. And when the good housewife is scrubbing, scouring and brushing, and, nevertheless, marvelling that her house is so infested with mould, she hardly suspects that her troubles would be more easily removed by the axe or saw than by all her cloths and brushes. A house should never be closely surrounded with shrubs. A free circulation of air should be maintained all about it, and shade trees so disposed as to leave large openings for the light and sun to enter. Houses that are crowded with trees, are not healthy, and plants should be abjured in every bedroom. Roads cannot be kept dry, that are closely shaded with trees, and shade trees in cities should always be kept trimmed well in their branches.

It has been computed that the land of the globe would be equal to the support of fifteen times the number of its present inhabitants, or might sustain a population of fifteen thousand millions.

MECHANICAL MOVEMENTS.

The Fusee.



Any carriage that is driven by a band from a spiral fusee, the traverse of the carriage will certainly be according to the diameters on which the band acts. This is so very apparent that it requires no explanation. This being one of our mechanical movements, it may be asked to what part of machinery is it now applied? We answer the worm or screw driver is just this principle, but its most beautiful exemplification is, not in the exact manner represented in the above cut, but upon the same principle, to be seen in the operation of the self-acting mule frame for spinning cotton—the copeing machine.

Wheels.

The rule to compute the number of teeth required in a train of wheels to perform a certain number of revolutions by having a knowledge of the speed and number of teeth on the main driver, is not known to many.—The rule derived is taken from the mathematical proposition, "as the velocity required is to the number of teeth in the driver, so is the velocity of the driver to the teeth in the driven." Therefore to find the proportion that the wheels in a train should bear to each other, subtract the less velocity from the greater, and divide the remainder by the number of one less than the number of wheels in the train, the quotient will be the number, rising in arithmetical progression, from the least to the greatest velocity of the train of wheels.

EXAMPLE.

What is the number of teeth in each of three wheels to produce 17 revolutions per minute the driver having 100 teeth and making 3 revolutions per minute? Subtract the less velocity from the greater and divide by the number less one of wheels for the progressive number of velocity, thus 17—3=14, the result then divide by 1 less than 3, and 7 is the number, which subtract from 17 and 10 is the progressive velocity: therefore 3, 10, 17 are the comparative velocities of the wheels. Now for the number of teeth in each. As the least velocity is to the greatest number of teeth, so is the medium velocity (10) to the number of teeth in the medium wheel.

Therefore $\frac{3 \times 100}{10} = \frac{300}{10} = 30$—is the number of teeth in the medium wheel. Now for the number of teeth in the third or extreme wheel in the train. As the medium velocity is to the medium number of teeth, so must the greatest velocity be to the smallest wheel or least number of teeth, viz.

$$\frac{30 \times 10}{17} = \frac{300}{17} = 17.11$$

Therefore the number of teeth in each of three wheels, and knowing the first to be 100 making three revolutions per minute, to produce a motion nearly six times greater, the second wheel will have 30 teeth, and the extreme wheel 17. A large cog wheel with 100 teeth on the main shaft of a water wheel will drive a small shaft on which the wheel with 17 teeth is geared, nearly six times as fast as the main shaft.

The relative velocities and number of teeth in a train of wheels of any number may be computed by the above simple rule and the mathematical propositions wrought out by simple arithmetic, will be valuable to many men, as books on such subjects are generally mystified with the *hieroglyphics* of abstract science.

Use of the Microscope.

At the quarter session recently held at Cardiff, England, a prisoner was convicted for displacing rails on the Taff Vale line, and sentenced to seven years transportation. The evidence principally turned on a stick having been cut to drive out the bolts, or keys, as they are called, by which the bolts are fastened in the chairs: and on the marks (parallel lines) on this stick corresponding with two notches in a knife found on the accused. The one mark was visible enough, the other faint and doubtful, but the learned counsel ordered a microscope into court; the jury saw and were satisfied —*Literary Gazette.*

Mode of Grafting.

A cloth covered with wax and wrapped closely around the bottom of the graft and the whole of the cut limb and split is a very speedy and effectual way of grafting. The easiest and most expeditious way of preparing the cloth is to dip it into the wax when hot, and "strip" the cloth between two sticks, so as to squeeze from it all the composition possible, and spread it out until it dries or becomes cool. The process is very speedy, more so than any other, full as successful and very neat. If the weather is cold when the composition is made, the use of lard instead of tallow renders the cloth more pliable.

The cloth should be tied with a small piece of cord, not too hard around the whole.

To Preserve Water in Sea Casks and Cisterns.

It is said that water may be preserved quite pure, either in long voyages, or in cisterns, by the addition of about 3 lbs. of black oxide of maganese powdered: stir it well together, and the water will loose any bad taste it may have acquired, and will keep for an indefinite length of time.

Mending China.

The following cement has been recommended for mending china:—Take a piece of flint glass, beat it to a fine powder, and grind it extremely fine on a painter's stone with the white of an egg, and it joins china without rivetting, so that no art can break it in the same place. This may be done in a mortar, if the party has not a suitable stone.

Queer Watches.

Bracelets, with watches inserted in them, are becoming all the rage in some of the eastern cities. They have long been common in Paris, where it is also the practice to insert watches into finger-rings, canes, and breast-pins.

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